

REMARKS

Claims 1-33 are pending in the application. Claims 19-33 have been cancelled by this amendment. New claims 34-37 have been added to the application. Therefore, claims 1-18 and 34-37 are at issue.

Claim 1 has been amended to clarify that the claim is a composition claim and not a product-by-process claim. In particular, claim 1 has been amended to recite that the amphipathic copolymer comprises a first comonomer and a second comonomer. Claim 11 has been amended to insert a chemical name for the BIS-PEG 15 dimethicone/IPDI copolymer. Support for this amendment can be found at page 34, lines 15-18 of the specification. Claim 13 has been amended to correct a typographical error in the claim.

Claim 14 has been amended to depend from new claim 34, which provides an antecedent basis for the hydrophobic liquid recited in claim 14. Similarly, the dependency of claims 4, 5, and 18 have been corrected. Support for new claim 34 can be found in originally filed claim 14 and in the specification. Support for new claims 35 through 37 can be found in the tables and examples of the specification. In particular, see Table 1, Gel 1 which contains 21.66% sodium bentonite clay, and Table 3, Test No. 1 which contains 15.63% of Gel 1. Test 1 of Table 3 therefore contains 3.4 wt% of a layered silicate.

The present invention is directed to a composition capable of thickening hydrophobic liquids. The composition comprises (a) a layered silicate material, wherein the surfaces of the layered silicate are modified by (b) an amphipathic copolymer. The amphi-

pathic copolymer comprises (i) a first comonomer that when homopolymerized generates a hydrophilic polymer that is insoluble in a hydrophobic liquid and (b) a second comonomer that when homopolymerized generates a hydrophobic polymer that is soluble in a hydrophobic liquid.

Claim 34 recites that the composition can further comprise a hydrophobic liquid, as further recited in claims 4 and 5. The compositions of claim 34 and claim 14 provide a thickened hydrophobic liquid having a Brookfield viscosity of at least 5,000 cps, and typically at least 50,000 cps, at 25°C and 0.5 rpm when 3.4 wt% of the layered silicate is present.

Compositions of the present invention can further comprise an optional thickening aid (claims 2, 3, and 15) and/or an optional functional particulate material (claims 16 and 17).

As set forth below, the presently claimed compositions have an unexpected ability to thicken hydrophobic liquids, and the compositions are neither taught nor suggested by the cited references, alone or in combination.

Claim 11 is objected to because of the recitation of BIS-PEG 15. Applicants have amended claim 11 to overcome this objection by inserting the chemical name of the recited copolymer. Accordingly, it is submitted that this objection has been overcome and should be withdrawn.

Claims 1-9 and 14-18 stand rejected under 35 U.S.C. §103 as being obvious over Finlayson U.S. Patent No. 4,208,218 ('218) in view of Wong et al. U.S. Patent No. 4,830,945 ('945). The examiner contends that be-

cause the '218 patent teaches surface modifying a layered silicate material with a quaternary ammonium compound, and because the '945 patent teaches resin particles with amphiphatic copolymer moieties having an ability to act as steric stabilizers, that the present claims would have been obvious. Applicants traverse this rejection.

The '218 patent is directed to an organophilic clay gellant comprising the reaction product of a smectite-type clay having a defined cation exchange capacity and a quaternary ammonium compound (QAC), which is monomeric and cationic. The '218 patent teachings are limited to a clay treatment using a QAC, and absolutely fails to teach or suggest any other monomeric, let alone polymeric, modifying agent for the smectite clay.

The QAC disclosed in the '218 patent is defined at column 2, lines 34-55. This QAC is a monomeric compound, as opposed to the polymeric modifying compound recited in the present claims. The '218 patent fails to teach or suggest any polymer as the smectite clay modifying agent, and, therefore, the '218 patent cannot possibly teach or suggest the specific type of copolymer recited in the present claims.

The chemical properties of the QACs disclosed in the '218 patent are substantially different from the amphiphatic copolymer recited in the present claims. A QAC is a low molecular weight cationic surfactant. The presently claimed copolymers are high molecular compounds and are not cationic. Accordingly, a person skilled in the art would not have been motivated from the '218 patent to substitute any polymer for the

quaternary ammonium compound of the '218 patent, let alone the amphipathic copolymer recited in the present claims.

Although the QAC treated clays of the '218 patent thicken hydrophobic liquids, a jump in reasoning that to conclude all treated clays thicken hydrophobic liquids simply cannot be made. In fact, and to the contrary, not all dispersions of treated clays thicken hydrophobic liquids.

In addition, the presently claimed composition effectively thickens hydrophobic liquids to an unexpected degree and overcome disadvantages associated with clay-QAC thickeners, such as those disclosed in the '218 patent. For example, the presently claimed compositions avoid the skin irritation properties of QACs, which increases the range of practical applications in which the present compositions can be used. Further, the '218 patent requires a clay having a minimum cation exchange capacity (CEC) because an ion-exchange reaction occurs between the cationic QAC and the clay. The properties of such a treated clay vary depending on the CEC of the clay. The presently claimed compositions do not rely upon the CEC of the clay, thus composition properties are more uniform.

Finally, the presently claimed compositions outperform the treated clays of the '218 patent. A composition of the present invention containing PEG 30 dipolyhydroxystearate as the amphipathic copolymer was added to a hydrophobic liquid, i.e., octyl stearate, at a 5 weight percent (wt%) loading of the clay in the composition. The resulting Brookfield viscosities of the thickened octyl stearate compositions were 140,000

cps (centipoises) at 1 rpm and 84,000 cps at 5 rpm. A clay treated with methyl benzyl distearyl ammonium chloride, as disclosed in the '218 patent, when added to octyl stearate at the same 5 wt% loading level of the clay provided Brookfield viscosities of only 88,000 cps at 1 rpm and 28,000 cps at 5 rpm. Compositions of the present invention are clearly superior thickening agents for a hydrophobic liquid than the clay-QAC composition of the '218 patent.

It is submitted that a person skilled in the art, after reading the '218 patent, simply would not have had any motivation or incentive to substitute a presently claimed amphipathic copolymer for the monomeric, cationic quaternary ammonium compound disclosed in the '218 patent with any expectation of achieving the unexpectedly high degree of thickening provided by the presently claimed compositions. The '218 patent provides no teachings or suggestions that any compound can be a substituted for the QACs disclosed therein, and, because of the substantial chemical and physical differences between a claimed amphipathic copolymer and a QAC, a person skilled in the art simply would not make a huge and illogical leap in reasoning to substitute an amphipathic copolymer for a QAC to treat a clay.

The '945 patent fails to cure the deficiencies of the '218 patent such that a combination of the '218 and '945 patents cannot render the present claims obvious. The '945 patent is directed to a photographic developer. The developer contains resin particles having amphipathic copolymeric moieties attached thereto. These moieties act to prevent flocculation. The

examiner contends that it would have been obvious to use an amphipathic copolymer taught in the '945 patent as a substitute for the QAC of the '218 patent and thereby arrive at the presently claimed invention.

Applicants traverse this conclusion.

As stated above, the '218 patent, directed to treated clays, absolutely fails to teach or suggest any possible substitutions for QACs disclosed therein. The '945 patent is not directed to clays, but is directed to resins having a modified surface. The examiner has not pointed to any nexus between the '218 and '945 patents that would lead a person skilled in the art to consider the references in combination.

The examiner has taken isolated teachings from the two references, and in a hindsight reconstruction, concluded that the present claims are obvious. The '945 patent does not teach or suggest that a clay can be substituted for the resins disclosed therein, and persons skilled in the art are aware of substantial differences between resins and clays such that a modifying agent for either a resin or a clay is not automatically considered a modifying agent for the other. Thus, a person skilled in the art, guided by the combined teachings of the '218 and '945 patents, would not be motivated to substitute either an amphipathic copolymer of the '945 patent for the QAC of the '218 patent, or the clay of the '218 patent for the resin of the '945 patent. Neither the '218 patent nor the '945 patent teaches or remotely suggests such substitutions. Applicants, therefore, submit the combination of cited references fails to provide any motivation or incentive wherein either the amphipathic copolymer of the '945

patent can be substituted for the QAC of the '218 patent or the resin of the '945 patent can be substituted for the clay of the '218 patent.

In summary, the combined teachings of the '218 and '945 patents fail to teach or suggest the present invention, and fail to provide any motivation for a person skilled in the art to modify the teachings therein and arrive at the presently claimed invention. Because the fields of resins and clays, and amphipathic copolymers and QACs, are so diverse, and because the combined teachings of the cited references fail to provide any nexus between the disclosed subject matter, it is submitted the rejection of claims 1-9 and 14-18 as being obvious over a combination of the '218 and '945 patents is in error and should be withdrawn.

Applicants also point out the following with respect to comments and contentions set forth in the Office Action:

(a) the examiner admits that the QACs of the '218 patent are different from the claimed amphipathic copolymer (Office Action, page 6), but fails to point out any teachings from the references that would suggest a substitution of a QAC for an amphipathic copolymer, or vice versa;

(b) the examiner states that the amphipathic copolymer of the '945 patent acts as steric stabilizers, which prevents flocculation. This is entirely different from the problem addressed by applicants, which is thickening of a hydrophobic liquid. The prevention of flocculation and thickening of a hydrophobic liquid are separate problems, and addressing one may not address the other. For example, preventing floc-

culation does not necessarily mean a composition also is thickened and in fact, typically the opposite occurs; and

(c) the examiner states that the '218 patent reads on claim 18 because of a teaching using 1500 grams of bentonite in water and adding 39.3 grams of a modifier. Claim 18 requires dissolving the amphipathic copolymer in a *hydrophobic* liquid. No water is included in the method of claim 18.

In summary, for all the reasons set forth above, it is submitted that claims 1-9 and 14-18 are patentable over a combination of the '218 and '945 patents, and that this rejection under 35 U.S.C. §103 should be withdrawn. For the same reasons set forth above, it is submitted that new claims 35-37 also are patentable over the cited references.

Claims 10, 12, and 13 stand rejected under 35 U.S.C. §103 as being obvious over the '218 patent in view of the '945 patent and in further view of Adams et al. U.S. Patent No. 6,649,138 ('138). The examiner relies upon the '138 patent for a teaching of amphipathic compounds that modify the surfaces of nanoparticles. For the reasons set forth above, and hereafter, it is submitted that this rejection is in error and should be withdrawn.

The patentability of the present claims over a combination of the '218 and '945 patents has been discussed above, and this discussion also applies to dependent claims 10, 12, and 13. Claims 10, 12, and 13 recite preferred embodiments of the invention, and are patentable over the cited '218 and '945 patents for the same reasons that claims 1-9 and 14-18 are patentable

over these references. It is further submitted that objected to claim 11 is patentable for the same reason that claims 1-9 and 14-18 are patentable.

It is further submitted that the '138 patent fails to cure the deficiencies of the '218 and '945 patents, alone or in combination. The '138 patent is directed to *semiconductive* and *metallic* nanoparticles that are more readily *dispersed* in *aqueous* media. This reference merely teaches amphipathic copolymers, on semiconductive and metallic substrates, and provides no teaching or incentive that would lead a person skilled in the art to make the substitutions required to arrive at the presently claimed invention.

In particular, the examiner has cited art directed (a) to a clay treated with a QAC (which bears no relation to an amphipathic copolymer), (b) to a resin having amphipathic moieties on its surface, and (c) to a semiconductor or metallic nanoparticle treated with an amphipathic copolymer. There is no correlation between these cited references that would lead a person skilled in the art to arrive at the present invention. Note that the '138 patent is directed to dispersibility in an aqueous liquid, not thickening of a hydrophobic liquid. Therefore, why would a person skilled in the art consider the '138 patent when trying to solve the problem of thickening a hydrophobic liquid? In fact, the '138 patent would discourage use of an amphipathic polymer to thicken liquids.

The examiner apparently has selected isolated teachings from different arts to reconstruct applicants' claimed invention. The examiner has failed to point out why a person skilled in the art would make

the substitutions suggested by the examiner from the combined teachings of the references. The cited art fails to provide any motivation or incentive for a person skilled in the art to make such substitutions, with a reasonable expectation of providing a composition capable of effectively thickening hydrophobic liquids.

Accordingly, it is submitted that claims 10, 12, and 13 would not have been obvious over a combination of the '218, '945, and '138 patents, and that this rejection should be withdrawn.

Claims 19-25, 27, and 28 stand rejected under 35 U.S.C. §103 as being obvious over the '218 patent in view of the '945 patent and in further view of Fonshy U.S. Patent No. 4,846,992 ('992). This rejection now is moot in view of the cancellation of claims 19-25, 27, and 28. It should be understood that these claims were not cancelled because of reasons related to patentability, but to facilitate prosecution of this application. Applicants cancelled claims 19-25, 27, and 28 without prejudice, and reserve the right to pursue the subject matter of these claims in a continuing application.

It is submitted that the claims are now in proper form and scope for allowance. An early and favorable action on the merits is respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form in an effort to advance this application toward allowance, the examiner is urged to telephone the undersigned at the indicated number.

Respectfully submitted,

MARSHALL, GERSTEIN & BORUN LLP

By

James J. Napoli

James J. Napoli
(Registration No. 32,361)
Attorneys for Applicants
6300 Sears Tower
233 South Wacker Drive
Chicago, Illinois 60606
(312) 474-6300

Chicago, Illinois
June 28, 2005